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| Date | December 11, 1995 |
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| Company Name | EPA Region III |
| Attention | John Banks X-34 W/2 J |
| From | Mark Moeller |
| Number of Pages to Follow | 10 |
| Comments/Special Instructions: John, Jim and I have prepared this Work Plan for the work to be performed at the MW-2 area at the Brodhead Creek Site. We would like to begin this work as soon as possible. So please review these pages and call me with any comments or questions. A hard copy of this document will follow by mail, after any revisions have been made. Thank you, Mark Moeller | |

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**MW-2 AREA WORK PLAN
Brodhead Creek Superfund Site
Stroudsburg, Pennsylvania**

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1.0 INTRODUCTION

This document will provide justification for and a description of activities proposed to remove subsurface tar from the MW-2 area at the Brodhead Creek Superfund Site in Stroudsburg, Pennsylvania. The document discusses the following:

- remedial action goals for the site;
- descriptions and results from previous investigations performed at the MW-2 area;
- proposed equipment requirements;
- a proposed operating plan; and
- reporting requirements.

2.0 REMEDIAL ACTION GOALS

On September 2, 1992, the Consent Decree for the Brodhead Creek Superfund Site was entered in the U.S. District Court for the Eastern District of Pennsylvania. According to the Consent Decree, the remedial action goal for the site is the removal of 60% of the free coal tar in both the RCC and the MW-2 areas. However, this goal was modified slightly for the RCC area because the estimates of existing coal tar were bound to be inaccurate since the RCC area investigations revealed patchy and discontinuous areas of tar. Therefore, Pennsylvania Power and Light Company (PP&L) and EPA agreed to remove the coal tar until removal efforts yielded little additional benefit. A precise calculation for this endpoint was also agreed upon.

Enhanced Recovery (CROWTM) was the selected remedy for these areas. In June of 1994, construction of the CROWTM system was initiated for the RCC area. This system has been operating since July of 1995 and will continue operation into early 1996. However, due to a lack of information about the lateral extent of tar in the MW-2 area, a subsequent investigation was conducted to determine the correct remedial system for this area.

3.0 MW-2 AREA INVESTIGATION

One of the possible reasons that tar has accumulated in the MW-2 area is the installation of a slurry wall which blocked the tar's migration toward the RCC area. According to the approximate location of former coal gasification activities, coal tar could have been discharged into the subsurface near a location that was later bisected by the installation of the slurry wall. The majority of the subsurface coal tar was free to drain along the top of the silty sand layer back into the RCC area. However, some of the tar may have been isolated on the other side of the slurry wall. This coal tar appears to have accumulated at a low point in the silty sand unit adjacent to the wall. This low point represents the MW-2 area.

In December of 1992, a supplemental investigation was conducted in which concentric wells were installed around MW-2. The purpose of the wells was to identify the lateral continuation of the free tar deposit. If free tar was observed in any of these wells, another round of concentric wells was to be installed to further attempt to locate the tar boundaries. Each of these wells were to be installed six to ten feet from the previous well.

According to the results of the investigation, no free tar was found in any of the first round of concentric borings. Therefore, these borings were finished as two-inch diameter PVC monitoring wells (MW-2A, MW-2B, and MW-2C). However, during monitoring rounds in February and June of 1993, small amounts of tar were observed in the bottom three feet of MW-2B. The top level of this tar coincided with the top level observed in MW-2 during the June monitoring round. This indicated that a continuous free-phased tar accumulation may exist between MW-2 to the south and MW-2B to the north. Approximately 8 more feet to the north is MW-13. No free tar was observed in this well during the same monitoring round. Perhaps this is because the elevation of the silty sand layer is higher in MW-13 than the top-of-tar elevation in MW-2 and MW-2B. This would indicate that the northern boundary of the accumulation lies between MW-2B and MW-13 and is bound by a rise in the silty sand layer. The other boundaries include the slurry wall and wells MW-2A and MW-2C. The total square footage of this accumulation is approximately 70 square feet and the average depth of the free tar is approximately 0.6 feet above the silty sand layer. A typical porosity for the stream gravel formation is approximately 30% while the tar saturation within the pores may be as high as 50%. Therefore, the estimated volume of free tar within the MW-2 area is approximately 50 gallons. However, this estimate is also likely to be inaccurate because it was determined with only two real data points, both of them monitoring wells. Tar levels as

measured in monitoring wells do not necessarily correspond to tar levels within an aquifer. This is due to differences in viscosity, density, and surface forces between tar and water. In light of the potential inaccuracy of these estimates, we propose to remove the tar from this area as completely as possible using the process defined in Section 5.0 of this document.

EPA and PP&L have concluded that the probable volume of tar in the MW-2 area is too small to remove with a CROW™ system. Therefore, we are proposing to remove this tar through intermittent pumping of wells MW-2 and MW-2B. Both of these wells are fully screened PVC wells that have been sumped into the silty sand layer several feet. The depth of well MW-2 is 25 feet and the well diameter is 4 inches. The depth of well MW-2B is 21 feet and the diameter is 2 inches.

4.0 CONSTRUCTION PLAN

The proposed pumping system for wells MW-2 and MW-2B involves using an electric, peristaltic, Master Flex pump and flexible tubing. The pump is capable of operating at a rate range of 50 ml/minute to 500 ml/minute. This particular setup is very similar to the setup used during the tar pump tests in 1993. From these pump tests, we concluded that tar should be pumped at as low a rate as possible. This will allow a much longer pumping duration and a greater volume of pumped tar prior to water "breakthrough". All of the equipment and labor necessary to remove tar from these two wells will be provided by RETEC.

All produced tar and water will be pumped into 5 gallon buckets and then transferred into the water treatment system associated with the CROW™ system.

5.0 OPERATION PLAN

The proposed MasterFlex pump system is designed to remove DNAPL from the MW-2 area. Therefore, the system should operate only when DNAPL is present in either well MW-2 or MW-2B.

To verify the presence of DNAPL in the two wells, several techniques are available:

- 1) An oil/water Interface Probe designed to detect changes in conductivity associated with DNAPL;
- 2) A disposable bailer can be used to sample the liquid at the bottom of the wells; and
- 3) A cotton string with an attached weight can be lowered into the well and then removed to reveal staining where DNAPL is located.

The operator will use one of these methods, at least once per week in each well, for determining DNAPL presence. The measured levels of DNAPL will be recorded, along with the measuring technique, in a field log dedicated to the MW-2 activities. All field notes will be included as an appendix within the final report.

If the operator discovers DNAPL in either of the two wells, he/she will position the MasterFlex pump at the appropriate well and ensure that all necessary fittings are properly connected. The pump will be connected to a 110 volt power supply taken from the on-site tank farm. The intake line will be lowered to within 2 inches of the bottom of the well. The discharge line will be placed within a 5 gallon bucket that will be dedicated to this use. The pump will be initially operated at its slowest rate. If this rate fails to produce tar, the rate will be slowly increased until tar is produced, at which point the rate will be decreased as much as possible. The operator will immediately check all associated tubing and piping for leaks and make repairs if necessary. Following startup, the pump will remain in operation until water starts to be discharged with the tar. At this point, the tar level within the well will be measured. If the pure tar is no longer present, then the operator will no longer pump. If pure tar is still present, the operator will attempt to remove it by pumping some more, until pure tar is no longer detectable. The operator will record the volume of recovered tar in the MW-2 field logs.

All tar and water will be collected in 5 gallon buckets. Once the bucket is half full, the operator will move the bucket into the tank farm. We do not expect to pump more than 5 gallons per pumping event. After all the pure tar is removed from the well, the operator will decontaminate the pumping equipment within the tank farm and contain all decontamination waters. All tar and water associated with the procedure will be pumped into one of the process tanks.

As stated previously, the operator will inspect wells MW-2 and MW-2B for the DNAPL at least once per week. If DNAPL is not encountered in either well for a period greater than two months, a different measuring method will be used. If none of the previously mentioned tar measuring methods show the presence of tar, the removal operation will be considered complete.

6.0 REPORTING

At the end of every month, all work activities associated with the MW-2 area will be summarized within the monthly progress report for the Brodhead Creek Site. If work activities at MW-2 continue after other site activities have subsided, monthly reports will continue to be prepared until the removal activities have concluded. After all the removable tar has been pumped from the MW-2 area, a final report will be prepared that documents all field activities and includes all field notes. The final report will be submitted to EPA through PP&L and Penn Fuels.